**Hillcrest high school**



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**Course Outline for 2010-2011**

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| **Grade** | **Course Name** | **Course Type** | **Course Code** | **Prerequisite** |
| 12 | Physics | University | SPH4U | SPH3U |

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| **Course Overview** |
| This course enables students to deepen their understanding of physics concepts and theories. Students will continue their exploration of energy transformations and the forces that affect motion, and will investigate electrical, gravitational, and magnetic fields and electromagnetic radiation. Students will also explore the wave nature of light, quantum mechanics, and special relativity. They will further develop their scientific investigation skills, learning, for example, how to analyse, qualitatively and quantitatively, data related  to a variety of physics concepts and principles. Students will also consider the impact of technological applications of physics on society and the environment. |

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| **Course Content** | Number of periods |
| ***Dynamics***   * Forces affect motion in predictable and quantifiable ways. * Forces acting on an object will determine the motion of that object. * Many technologies that utilize the principles of dynamics have societal and   environmental implications. | 16 |
| ***Energy and Momentum***   * Energy and momentum are conserved in all interactions. * Interactions involving the laws of conservation of energy and conservation of momentum can be analysed mathematically. * Technological applications that involve energy and momentum can affect society and the environment in positive and negative ways. | 16 |
| ***Gravitational, Electric, and Magnetic Fields***   * Gravitational, electric, and magnetic forces act on matter from a distance. * Gravitational, electric, and magnetic fields share many similar properties. * The behaviour of matter in gravitational, electric, and magnetic fields can be   described mathematically.   * Technological systems that involve gravitational, electric, and magnetic fields can have an effect on society and the environment. | 16 |
| ***The Wave Nature of Light***   * Light has properties that are similar to the properties of mechanical waves. * The behaviour of light as a wave can be described mathematically. * Technologies that use the principles of the wave nature of light can have societal and environmental implications. | 16 |
| ***Revolutions in Modern Physics: Quantum Mechanics and Special Relativity***   * Light can show particle-like and wave-like behaviour, and particles can show wavelike behaviour. * The behaviour of light as a particle and the behaviour of particles as waves can be   described mathematically.   * Time is relative to a person’s frame of reference. * The effects of relativistic motion can be described mathematically. * New theories can change scientific thought and lead to the development of   new technologies. | 16 |

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| **Assessment** | **Weighting** |
| **Class work**   1. Knowledge and Understanding (24%) 2. Thinking and Investigation (24%) 3. Communication (11%) 4. Application (11%) | 70% |
| **Final evaluation**   1. End of Year Performance Task (10%) 2. Final Exam (20%) | 30% |

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| **Expectations** |
| **Learning Skills**  You will be graded on the following Learning Skills and your progress will appear on your report card.   1. **Work Habits:** the way you do your work and how it looks when it is done. 2. **Teamwork:** two or more people sharing the work to complete a task. 3. **Initiative:** the way you take charge of your learning. 4. **Works Independently**: the way you begin, work on and complete a task on your own. 5. **Organization:** the way you manage your work and materials. |
| **Lates to class**  Late arrivals are disruptive to the learning environment. Be on time or consequences may be applied. |
| **Absences from class**  Regular attendance is strongly linked to academic success. When you have been absent, you are responsible for obtaining class notes that you missed from another student in the class. If you are absent for lab work, you must arrange with the teacher for time to make it up. If anything was due the day you were away and you had prior knowledge of it, hand it in before class on the day you return. If your absence is planned (e.g., school sports), notify your teacher in advance. Refer to the student agenda. |
| **Missed Tests**  All students are expected to write tests on the assigned date. If you miss a test, bring a note from a parent indicating that they know you missed the test, and giving the reason. Make arrangements with the teacher for a time to make up the missed test. If it becomes known that you skipped a test, the teacher will call your home and consequences may be applied. Refer to the student agenda. |
| **Missed Assignments/Labs**  Assignments should be submitted on time, ensuring a more even distribution of the workload throughout the course. If you miss an assignment, you will be given the opportunity to complete similar work, if you and a parent have signed a “recovery contract” with the teacher. Note that it may not be possible to evaluate this work before the end of a reporting period. Refer to the student agenda. |
| **Textbooks**  If you lose your textbook, you will pay a replacement cost of $ 109.45 . If you damage your textbook, you will pay a minimum fee of $15.00. |
| **Lab Equipment**  You are responsible for the repair or replacement of lab equipment that you damage or break as a result of careless use. A list of replacement costs for common lab equipment is available from your teacher. |
| **Academic Ethics**  Academic fraud makes it impossible for the teacher to accurately judge whether or not certain knowledge and skills have been mastered by the student. Academic fraud includes behaviors such as cheating on tests or exams and submitting work that is not one’s own (plagiarism). Such behaviors will result in a phone call home, and the work will be regarded as incomplete until the student demonstrates competency. A “recovery contract” will be completed providing the student with another opportunity to demonstrate their mastery of the learning. Repeat offences will be dealt with according to a scale of consequences. Refer to the student agenda. |